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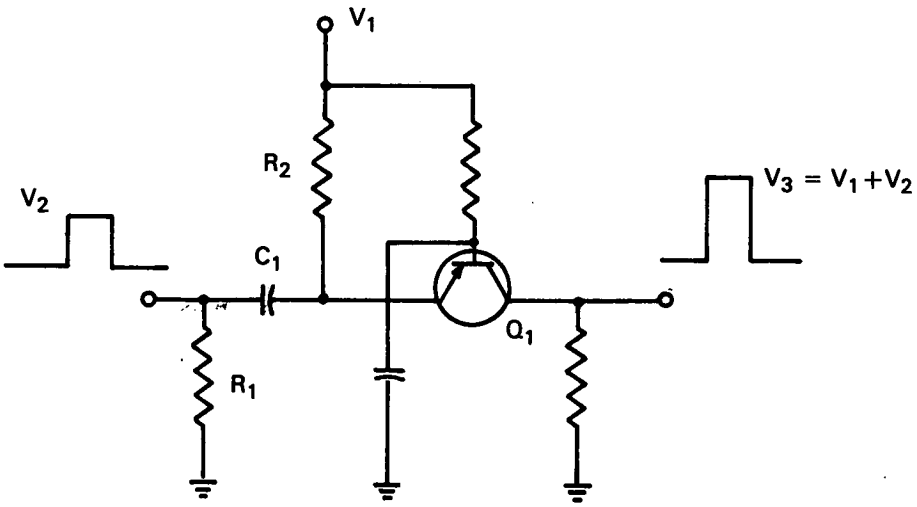
NASA TECH BRIEF

Simple, One Transistor Circuit Boosts Pulse Amplitude



The problem:

A requirement existed to supply a pulse voltage, higher than that normally available from emitter-follower circuits, to drive a 100-watt transmitter.

The solution:

A simple circuit that uses a single transistor to accomplish capacitor storage followed by common-base switching.

How it's done:

Capacitor C_1 is charged through R_1 and R_2 to the supply line voltage, V_1. With no input pulse, both the emitter and base of the transistor are at the same potential, and the collector is cut off. With an input pulse V_2 present, the potential of C_1 with respect to ground is increased by V_2. The emitter becomes more positive than the base and the transistor is switched on. This results in an output pulse, V_3 that is equal to V_1+V_2, minus negligible losses in C_1 and the transistor.

Notes:

1. In order for C_1 to reach approximate full charge between pulses, the ratio of charging interval to charging time constant must be much greater than the ratio of discharge interval to discharge time constant.
2. In tests, this circuit has produced a good output waveform at about twice the amplitude of the supply line voltage, V_1.
3. Inquiries concerning this innovation may be made to:

   Technology Utilization Officer
   Goddard Space Flight Center
   Greenbelt, Maryland 20771
   Reference: B66-10480

(continued overleaf)

Patent status:

No patent action is contemplated by NASA.

Source: M. W. Matchett and T. Keon
of Cutler Hammer
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